Chemistry 313 – Midterm Review Topics

***Chapter 1: Chemistry: The Science of Matter***

* Classify matter as either a substance (elements and compounds) or a mixture (homogeneous and heterogeneous).
* Describe techniques that can be used to separate mixtures (crystallization, distillation and filtration)
* Identify physical and chemical properties of matter.
* Distinguish between physical and chemical changes in matter.
* Apply the Law of Conservation of Mass to chemical change.
* Interpret chemical formulas
* Identify and describe the 3 states of matter (solid, liquid, and gas).
* Calculate density, mass or volume given the appropriate data.

***Math Unit*** *(not in book. Refer to the Powerpoint*)

* Convert between metric units (milli- to kilo-)
* Demonstrate the factor label method of conversion (dimensional analysis)
* Express numbers in scientific notation
* Perform calculations on numbers that are expressed in scientific notation

***Chapter 2: Matter is Made of Atoms***

* Relate historic experiments (Thomson and Rutherford) to the development of the atom.
* Describe Dalton’s, Thomson’s and Rutherford’s model of the atom to the current model.
* Interpret the information provided for each element on the periodic table.
* Describe the arrangement of electrons within atoms in terms of energy level, sublevel and orbital.
* Write the electron configuration for any element (1-56).
* Determine the number of valence electrons for an atom given the electron configuration
* Draw the Lewis Dot Structure for an atom.
* Describe the electromagnetic spectrum
* Compare and contrast a continuous spectrum with a bright line spectrum
* Identify wave characteristics (not in book, refer to notes).
* Calculate wavelength, frequency and energy given the appropriate data (not in book, refer to notes).

***Chapter 3: Introduction to the Periodic Table***

* Discuss the historical development of the periodic to include Dobereiner, Newlands, Mendeleev and Moseley.
* Predict the chemical and physical properties of elements by their position in the periodic table.
* Classify elements as metals, non-metals, or metalloids.
* Identify the properties of metals, non-metals, or metalloids.
* Classify elements by their chemical families: alkali metals, alkaline earth metals, halogens, noble gases, non-metals, metalloids, other metals, transition and inner transition metals.
* Describe the periodic trends of atomic size and electronegativity (not in book, refer to notes)

***Chapter 4: Formation of Compounds***

* Describe the properties of compounds in comparison to their constituent elements.
* Write ionic equations
* Draw structural formulas for molecules.
* Contrast the composition and properties of ionic and covalent compounds.

***Chapter 5: Types of Compounds***

* Name ionic and covalent compounds given their chemical formulas
* Determine the chemical formulas of a variety of ionic and covalent compounds given their names.